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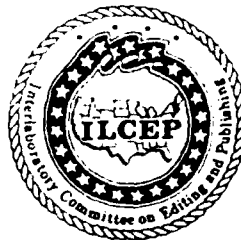
Reviewing the Technical Report

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APR 29, 1992
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13. ABSTRACT (Maximum 200 words)
This report is one of a series of monographs issued by the Interlaboratory Committee on Editing and Publishing (ILCEP). The committee comprises senior publication managers and editors at Navy and Marine Corps scientific and technical research activities. This monograph examines reviewing the technical report. The material is based on ILCEP members' combined experience in the publications field. The discussion is offered to all persons concerned with technical reporting to provide them with more information about the purposes and techniques of the review process. The authors hope that this information will help technical writers and reviewers understand this important step in the dissemination of technical information.

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Foreword

Many experienced scientists and engineers have only a general idea of what is expected of them when they are asked to review a technical report. Yet, the prepublication review by impartial advisers is an extremely critical step in report preparation.
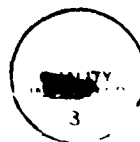
The review is recognized by experienced authors and administrators as a necessary safeguard against errors, misstatements, and oversights that might otherwise pass unnoticed. Still, many authors consider review a frustrating process set up to simply delay report publication. However, the reviewer should have in mind exactly what is expected to justify the time it takes, what is required, and what is not required.

The reviewer has a threefold responsibility to: (1) the author, (2) the performing organization, and (3) the readers of the report. This responsibility is discussed in detail and suggestions are made as to what a reviewer should and should not do. It is hoped this discussion will assist those faced with their first review, as well as provide a useful base for more experienced reviewers.

DAVID L. WOODS
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Reviewing the Technical Report

Types of Reviewers

There are two types of reviewers: line and technical. Both reviews may be done by the same person, but each review uses different criteria.

Line reviewers are individuals in the direct chain of command between the author and top management. They are responsible managerially for the performance of the work being reported and are concerned with deadlines, outputs, budgets, and policies. They may be concerned with specific issues such as security (verifying the classification level of the report and, if the report is classified, making sure that all components of the report are properly marked) and distribution (selecting the appropriate distribution statement taking into consideration parameters such as audience and organizational sensitivity, which may include controlled release of information pertaining to patents, copyrights, trademarks, test and evaluation, premature dissemination, direct military support, or export control including military critical technology and foreign government information).

Complementing these managerial reviewers are the technical reviewers who are subject-matter experts. Technical reviewers make an effort to improve the report value by evaluating the scientific and technical merit and suggesting ways to improve communication with the intended audience. They need not know how the work was financed nor who the customer is: their interest is not managerial. Instead, they are concerned with the accurate presentation of material, reasonable interpretation of data, and logical inferences. At times, these reviewers may not be in the same organization as the author.

They are asked to review a report because they are experts in the particular field of research or development.

For a report to be given adequate review, it needs to be examined by one or more individuals in each of these two review categories. Although each review takes a different approach, there is overlap. It is impossible to talk about the responsibilities of one without touching upon those of the other. For these reasons, in the discussion that follows, we will consider the "reviewer" as a single individual, realizing that portions of the work described may be performed by different people.

The appendix suggests a checklist for reviewers.

Preliminary Steps

For an effective review, there are two reasons the reviewer and author should discuss the report before it is read.

First, the reviewer must know why the report was written. Without this clearly in mind, there is no way of knowing whether or not the *purpose* was achieved. Technical reports are usually written for one or more of the following reasons:

To record. Reports written for the purpose of documentation are intended to place information into retrievable form so any person wishing to pursue investigations in the same field may have future access to the information. These reports sometimes follow a standard format and contain such elements as tables, illustrations, and derivations. Readability is particularly important, but accuracy and

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completeness are paramount. Increasingly, such reports are being created in machine readable form so they can be used as reference material.

To inform. These reports are prepared to communicate information to others who may be conducting the same or similar research. However, careful organization is essential to get the most important information to the reader in a clear and concise form. Detail may be sacrificed for timeliness because currency is the prime factor. Thus, the material contained in this kind of report is technically perishable.

To report progress. Frequently, these reports have a dual purpose. They are used to indicate how much work has been done during a given time with a definite amount of resources. At the same time, these reports may pass on technical detail to other researchers in the same field. Organization is important here; the report must be written in clear and easily understood statements that tell the story as briefly as possible. Accuracy must also be of concern. Such reports often are used to convey information to sponsors and may be supplemented with briefings.

To influence action. These reports are intended to influence certain individuals or organizations to act in a particular way. Writing skill, backed with effective presentation and logical organization, is highly important.

The secondary reason the reviewer should meet with the author is to discuss the intended audience. Such facts as language, number and type of illustrations, amount of detail in presenting derivations or procedures, and the organization of the report will differ depending on the intended audience.

Readers may be grouped into the following classes:

Administrators. These individuals have a good appreciation of what work is being done and why. They are concerned with management and may not have detailed knowledge of the theories and procedures followed by the researcher. They are interested primarily in results.

Technical colleagues. This group includes individuals trained in the same general field as the author but who may not have the specialized knowledge in the specific area that is being reported. They are interested in and can follow a fairly detailed discussion; to them a report can include more than would be of interest to the administrator.

Co-workers. Every report has a comparatively limited audience made up of individuals who work daily in the same field of endeavor as the author. They know the subject and are waiting for additional information. For such readers, the author can omit much of the preliminary discussion and get immediately into the details of the work.

Laymen. Classed in this group are all readers who either do not have the specialized background required to understand a technical treatment of the subject or lack the general administrator's knowledge and interest in the subject field. It is quite possible, for example, for a scientist in the field of nuclear fission to be a layman in the field of cultural relations. A report intended for this audience must be kept very general, and technical jargon must be avoided.

Clearly, the purpose and intended report audience are interrelated. When the reviewer has both of these factors clearly in mind, the review process can begin.

Responsibility to the Author

Technical content. Every reviewer has a basic responsibility to the author—to guard against the publication of factual errors. Probably, there is nothing more damaging to the professional reputation of a researcher than to write an article that contains a serious factual error. Such an error may haunt an individual for many years. To prevent such an occurrence, every author should be willing to have the report read by a competent, impartial reviewer. Small errors are not too serious, although they create an impression of carelessness that may cast a shadow over more important matters discussed in the report. The reviewer should list the errors and give them to the author; the reviewer is not expected to do the author's detail work. If the reviewer identifies major errors, these should be documented in a way the author can use constructively. Such errors might include inconsistencies in the logic leading up to conclusions or discrepancies between findings given in one part of a report and those presented in another.

The technical reviewer should have sufficient familiarity with the subject matter to accurately determine whether or not the author's findings or conclusions are contrary to the most recent developments. By pointing out such areas, the reviewer helps the author to strengthen arguments or reconsider findings.

Impact of report. The author also may expect the reviewer to tell him how effective his presentation has been. Acting in the capacity of "guinea pig" audience, the reviewer can give advice on whether the author has achieved his purpose. Is the presentation clear? Can it be followed without difficulty? Does the reader get all the information that is wanted or needed? Is the reader moved to action? If not, the reviewer should advise the author on how the report could be improved in order to increase its effectiveness. Such advice should always be made with a sincere desire to help the author, and a reviewer should never resort to sarcasm. Negative comments produce a defensive attitude by the author who may then resist any suggestions the reviewer makes. The reviewer assists the author only if this advice points toward a more positive, effective report.

Avoid bias. A reviewer must avoid unfair bias in evaluating a report that is in competition with his own scientific and technical expertise. From an ethical point of view, it is just as important to avoid favoritism toward any author. Some situations may require a blind review. Blind reviews require the author's identity be concealed from reviewers.

Matters of style. The reviewer's responsibilities include giving suggestions that help the author improve report writing skills. It is quite possible the report in hand is adequate for the purpose intended, but even so the author's presentation style, organization, or method could be improved.

Responsibility to the Organization

Maintaining high quality. The reviewer's responsibility to the performing organization is important, particularly in the case of the line reviewer. The reputation of a research and development organization, like that of an individual scientist, depends to a large extent upon the reports it publishes. An organization must be more careful and conservative than the authors because its reputation for quality work reflects upon all employees. It cannot afford to risk "casual" reporting, extreme conclusions, nor irresponsible

recommendations. Because of the risk involved, many research organizations insist that all reports be reviewed before publication.

Again, on behalf of the organization, the foremost task of the reviewer is to guard against the publication of factual errors. Given the facts set down in the report, the reviewer must examine them for accuracy, organization, and logical conclusions. Acting as the performing organization's representative, the reviewer must remain consistently impartial and endeavor to uncover any errors.

The reviewer must consider whether the quality of the information justifies official publication. Many research organizations publish more than one type of report. They may have formal and informal reports (i.e., full-scale technical reports and memorandum reports). Before beginning, the reviewer must know the class of work for review and the specifications for it. For example, information that is in process (fragmentary or transitory in nature) need not be held to the same high standards as a final report, which is intended to become a permanent part of technical literature. The reviewer must realize that some individual authors, spurred by the desire to see their name in print, occasionally attempt to publish reports that contain very little valuable information. Such reports can cause an organization more harm than good if they build a reputation for publishing inconsequential reports. A good reviewer is on alert to prevent such reports from being released.

Determining access. The reviewer may be involved in determining if the information can be released to the public. Public release is the act of making information available to the public without any restrictions. These controls are imposed because acquisition of military critical technology by potential adversaries significantly reduces the adversaries' risks when designing new weapons or defensive systems and can shorten the research and development cycle. Acquiring military critical technology can undermine national security severely by allowing adversaries to develop countermeasures to existing and anticipated defense systems (Cathcart, 1989).

Maintain corporate policies. The performing organization also relies on the reviewer to ensure that statements in its reports are not contrary to fundamental policies. In large organizations it is quite understandable that the individual researcher working in the laboratory may not be aware of all the organization's policies and could inadvertently make statements that would be contrary to the organization's interests. Line reviewers are expected to be alert for such statements protecting the organization against statements contrary to policy.

Guarding against contradiction. It is reasonable to expect the reviewer to watch for report statements that contradict those published by the organization in prior reports. Occasionally, individual researchers may be so engrossed in their own work that they miss a report published by another branch of their organization in a field that may overlap their own. The possibility of contradictory statements always is present. If the reviewer discovers such a situation, it should be pointed out to the author. This will ensure the contradiction is reconciled or explained properly in the report being reviewed.

Credits and copyrights. The reviewer must ensure proper acknowledgment has been made of the work of others in the same field either by statements in the text or by references to their publications, and that all necessary copyrights have been obtained.

This responsibility applies to tables of data, graphs, and illustrations, as well as the author's ideas and interpretations. Protecting proprietary information is important and may require special markings on the publication.

Responsibility to the Reader

Concise, clear, and accurate. The reviewer has a responsibility to the audience. Reviewers should try to eliminate obscure passages in the text, see that references to figures and tables are clear, and ensure points referred to in the text actually appear in figures mentioned and can be seen without difficulty. The main concern here is quality control to promote effective communication.

This is an area that borders on interfering with an author's "style." Reviewers should realize that if they find difficulty in following the author's argument, a large proportion of the audience may have equal difficulty. It is an imposition on readers to have to spend needless time ferreting out the meaning of inadequately prepared reports. The reviewer will do them a real service if questionable areas are brought to the attention of the author for rework.

Knowing the audience the author has in mind, reviewers should review the report as the reader and check the report for completeness and clarity. The reviewer should ensure the report has all the information necessary for accurate understanding without being overburdened by unnecessary detail.

Summary

Line and technical reviewers find themselves acting for three masters—the author, the performing organization, and the reader. As the reviewers perform their task, they should observe the following:

Learn the report's purpose.

Learn the report's intended audience.

Inspect for errors of fact (both large and small).

Determine whether the report content justifies publication.

Point out statements contrary to the performing organization's policy.

Eliminate or reconcile statements that contradict statements published by the organization in earlier reports.

Inspect for proper acknowledgment of the work of others.

Point out obscure or difficult textual passages.

Be sure that proper references are made to figures and tables.

Do not try to change the author's writing style.

Do not edit for grammar if the report is to pass through the hands of a professional editor.

Do not make technical or any other changes without calling them to the author's attention.

Do not make comments on the report that cannot be understood by the author.

Do not be sarcastic when commenting on the report.

Adhere to schedules.

Give suggestions for improving future reports.

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Publication Evaluation Checklist

This evaluation form is an aid for reviewers and can apply to a variety of publications, including (but not limited to) technical reports, informal reports, journal papers, and presentation manuscripts.

1. Content

   a. Were technical errors detected?
      If so, describe.

   b. Were mathematics checked?
      Indicate any errors.

   c. Are all appropriate references included?
      If not, give references.

   d. Is the publication appropriate for official release?

   e. Is the distribution appropriate?

2. Presentation

   a. Is the title appropriate and suitable for information retrieval?

   b. Is the development logical and complete, clearly indicating what was done and why?

   c. Does the abstract give a concise summary of the manuscript, its major findings, and conclusions?

   d. Are the summary and conclusions complete, easily read, and understood?

   e. Is the English generally acceptable?

   f. Should any material be shortened or more detailed?

   g. Are the figures/tables clear and self-explanatory?

3. Recommendations

   a. Are major changes suggested?

   b. Are the publication's classification and distribution statements appropriate?

   c. Are there inventions for which the award of patents should be considered?

4. Additional comments

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